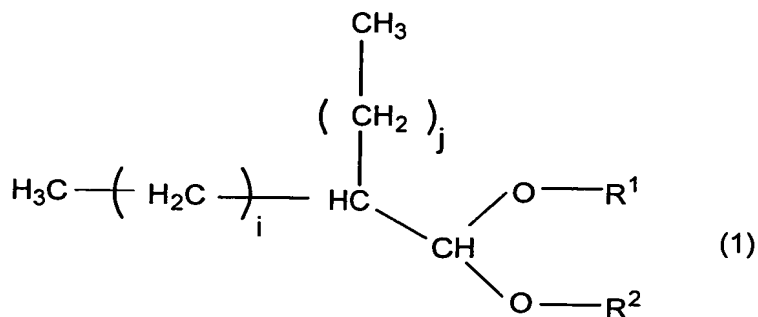


## CLAIMS

1. An alkylacetal compound having a structure represented by following general formula (1):

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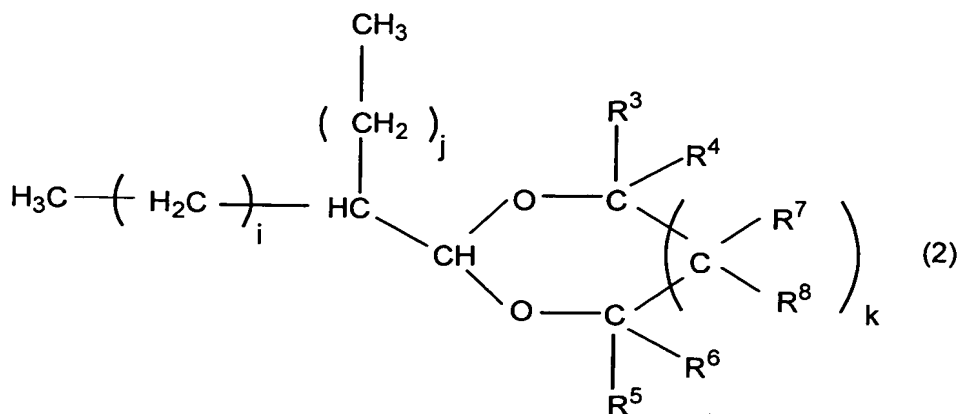
wherein  $\text{R}^1$  and  $\text{R}^2$  each independently represent a hydrocarbon group, and  $i$  and  $j$  each represent an integer satisfying a relation that a sum of the integers is in a range of 8 to 98.

10

2. An alkylacetal compound according to Claim 1, wherein  $i$  represents  $n$ , and  $j$  represents  $n+2$ ,  $n$  representing an integer in a range of 3 to 48.

3. An alkylacetal compound having a structure represented by following general formula (2):

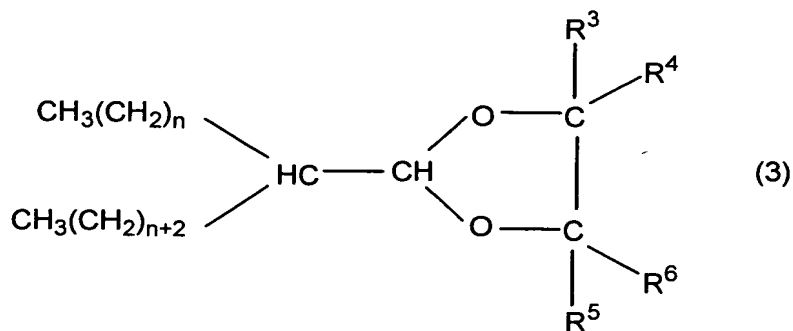
15



wherein  $\text{R}^3$  to  $\text{R}^8$  each independently represent hydrogen atom or a hydrocarbon group,  $k$  represents 0 or 1, and  $i$  and  $j$  each represent an integer satisfying a relation that a sum of the integers is in a range of 8 to 98.

4. An alkylacetal compound according to Claim 3, wherein  $i$  represents  $n$ , and  $j$  represents  $n+2$ ,  $n$  representing an integer in a range of 3 to 48.

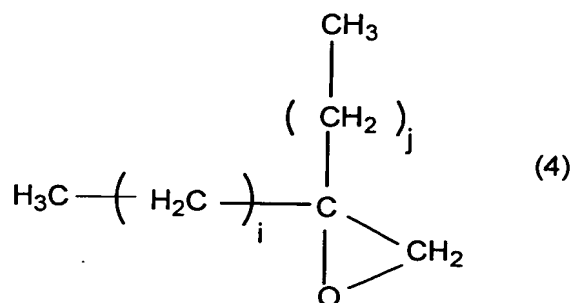
5. An alkylacetal compound according to Claim 4, which is represented by following general formula (3):



wherein  $\text{R}^3$  to  $\text{R}^6$  are as defined in general formula (2), and  $n$  represents

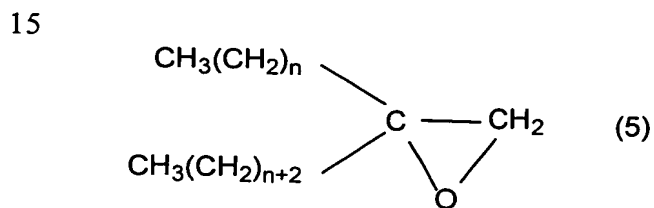
an integer in a range of 3 to 48.

6. A process for producing an alkylacetal compound described in any one of Claims 1 and 5 which comprises reacting an alcohol with an epoxide  
5 represented by following general formula (4):



wherein i and j each represent an integer satisfying a relation that a sum  
10 of the integers is in a range of 8 to 98.

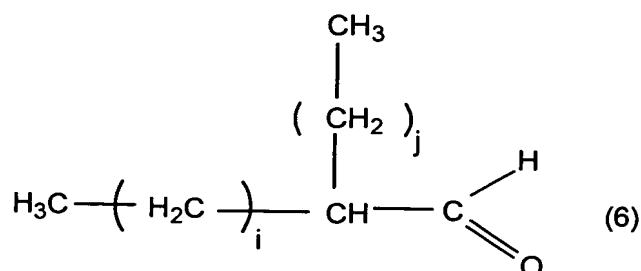
7. A process for producing an alkylacetal compound according to Claim 6, wherein the epoxide is a compound represented by following general formula (5):



wherein n represents an integer in a range of 3 to 48.

8. A process for producing an alkylacetal compound described in any one  
20

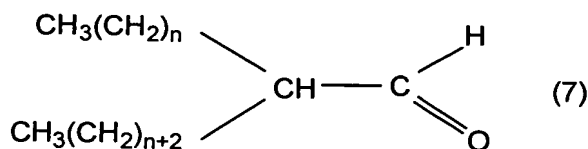
of Claims 1 and 5 which comprises reacting an alcohol with an aldehyde represented by following general formula (6):



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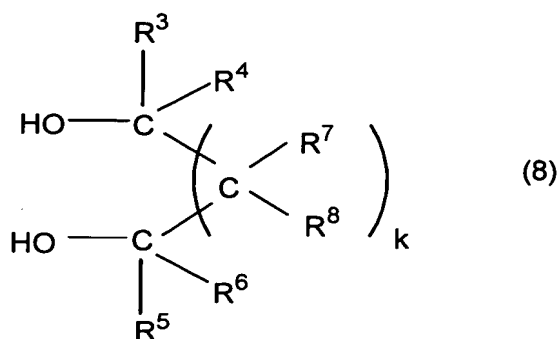
wherein i and j each represent an integer satisfying a relation that a sum of the integers is in a range of 8 to 98.

9. A process for producing an alkylacetal compound according to Claim 8,  
10 wherein the aldehyde is a compound represented by following general formula (7):



- 15 wherein n represents an integer in a range of 3 to 48.

10. A process for producing an alkylacetal compound according to any  
one of Claims 6 to 9, wherein the alkylacetal compound represented by  
general formula (2) is produced using as the alcohol a glycol represented  
20 by following general formula (8):

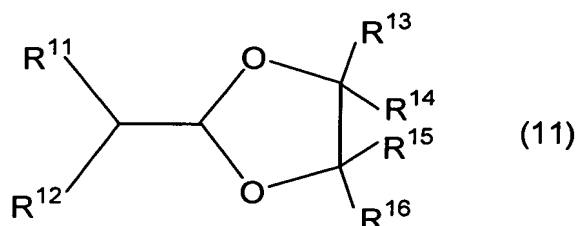


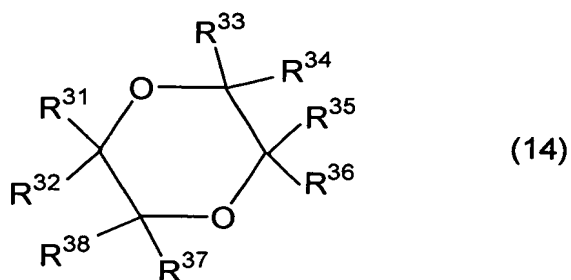
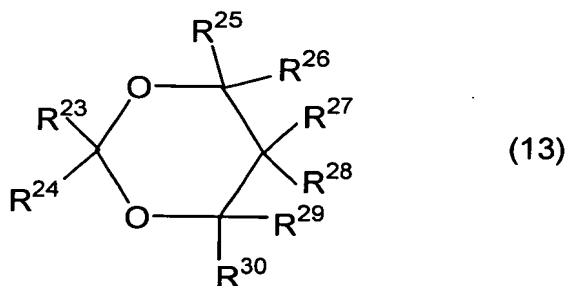
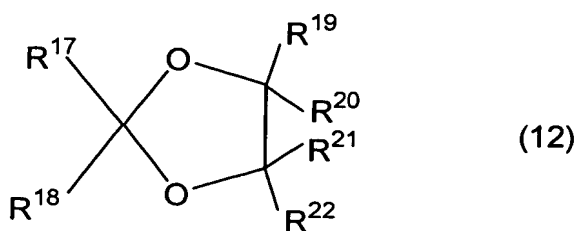
wherein R<sup>3</sup> to R<sup>8</sup> reach independently represent hydrogen atom or a hydrocarbon group, and k represents 0 or 1.

5

11. A process according to Claim 10, wherein the glycol is a compound selected from ethylene glycol, propylene glycol, 1,3-trimethylene glycol, derivatives of 1,3-trimethylene glycol and 1,2-butanediol.

- 10 12. A lubricating oil composition for metalworking which comprises a base oil and at least 1% by mass based on a mass of the composition of at least one compound selected from dioxolane compounds represented by following general formula (11), dioxolane compounds represented by following general formula (12), dioxane compounds represented by following general formula (13) and dioxane compounds represented by
- 15 following general formula (14):



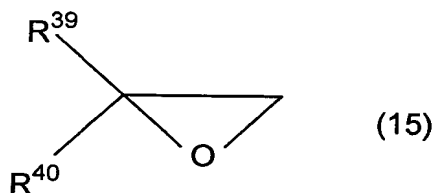


wherein R<sup>11</sup> to R<sup>38</sup> each independently represent hydrogen atom or a group selected from saturated hydrocarbon groups having 1 to 30 carbon atoms, unsaturated hydrocarbon groups having 1 to 30 carbon atoms and hydrocarbon groups having 1 to 30 carbon atoms and having ether bond, ester bond or hydroxyl group.

13. A lubricating oil composition for metalworking according to Claim 12, wherein at least one of R<sup>11</sup> to R<sup>38</sup> in general formulae (11) to (14) represents a hydrocarbon group having a hydrocarbon chain having nitrogen atom.

14. A lubricating oil composition for metalworking according to any one of Claims 12 and 13, wherein the base oil is at least one compound selected from polybutene, polyisobutylene and polyalkylene glycols insoluble in water and has a kinematic viscosity in a range of 5 to 3,000 mm<sup>2</sup>/s at 40°C, and a content of the base oil is 95% by mass or smaller based on a mass of the composition.

15. A lubricating oil composition for metalworking according to any one of Claims 12 to 14, which comprises at least 0.01% by mass based on a mass of the composition of at least one 2,2-dialkylepoxy compound represented by following general formula (15):



wherein R<sup>39</sup> and R<sup>40</sup> each independently represent a group selected from saturated hydrocarbon groups having 1 to 30 carbon atoms, unsaturated hydrocarbon groups having 1 to 30 carbon atoms and hydrocarbon groups having 1 to 30 carbon atoms and having ether bond, ester bond or hydroxyl group.

16. A lubricating oil composition for metalworking according to any one of Claims 12 to 15, which comprises 0.01 to 10% by mass based on a mass of the composition of at least one of benzotriazole and derivatives thereof.

17. A lubricating oil composition for metalworking according to any one of Claims 12 to 16, which is used for copper or a metal containing copper.